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Consulting with Caregivers

Using Formative Research to Improve Maternal and Newborn Care and Infant and Young Child Feeding in the Lao People's Democratic Republic

Anna Gillespie, Hilary Creed-Kanashiro, Deuanesay Sirivongsa,
Deuan Sayakoummane and Rae Galloway

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Health, Nutrition and Population (HNP) Discussion Paper

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Using Formative Research to Improve Maternal and Newborn Care and Infant and Young Child Feeding in the Lao People's Democratic Republic

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Abstract: Improving maternal and newborn care and young child feeding will decrease under-five mortality and malnutrition in developing countries. To help design interventions in these areas, a study was conducted in the Lao PDR. The study found that washing newborns after delivery and delaying breastfeeding for 1-3 days are common practices that may expose newborns to hypothermia. Few caregivers practice clean cord care and exclusive breastfeeding for the first six months, increasing the risk of infection. Most women deliver at home without assistance from a trained provider. They also restrict what they eat based on traditional beliefs about foods thought to affect mothers' health or breastmilk. Traditional beliefs also determine how young children are fed. Most caregivers, when asked to try four feeding recommendations for young children (add or give more animal food, increase the amount of food, number of feedings, and vegetables and fruits), were willing to try and continue them. Many caregivers were surprised about how much and what types of foods children can consume, if they are encouraged to, and valued receiving new information about how to improve young child feeding.

The study conclusions are that newborn care can be improved using low-cost technologies such as keeping newborns warm by deferring washing for 24 hours, and wiping, wrapping and breastfeeding newborns immediately after delivery. Risk of infection can be reduced by proper care of the umbilical cord and by exclusively breastfeeding infants for six months. What women eat can be improved by promoting the consumption of certain foods that improve the quality and quantity of breastmilk. To improve the feeding of young children, messages are needed about how much and what types of foods they require and how to encourage them to eat those foods.

Keywords: The Lao PDR, newborn care, maternal care, nutrition, young child feeding

Disclaimer: The findings, interpretations and conclusions expressed in the paper are entirely those of the authors, and do not represent the views of the World Bank, its Executive Directors, or the countries they represent.

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FOREWORD

With the target date for reaching the Millennium Development Goals (MDGs) looming, we must use all the tools we have available to achieve them. Because malnutrition is a barrier to achieving at least six of the MDGs, effective strategies to prevent malnutrition must be brought to bear. Behavior-change is the foundation of any effective, sustainable, and empowering strategy to prevent malnutrition, whether we're talking about infant feeding, growth promotion, food fortification, micronutrient supplementation, or food supplementation programs.

Of the many myths and misunderstandings perpetrated about nutrition programs, perhaps the most counterproductive are those concerning behavior change. Two such myths are that behavior changes slowly and that it's hard to change behavior. This paper shows that by using messages developed from careful formative research and Trials of Improved Practices (TIPs), it is possible to change behavior rapidly and relatively easily. One key finding of this research is that mothers were surprised to find out how much a young child can eat and that they need to actively feed children to get them to eat enough. An added value of changing behavior is that the changed behavior creates its own reinforcements. In this study, mothers found that when they improved feeding practices, the children became happier, more active, and slept better. The key lessons of this research show that careful formative research with clients similar to those targeted by the nutrition programs are essential to develop nutrition counseling messages. The study also shows that TIPs engage families in finding their own workable solutions to child feeding problems. This responds to another myth about behavior change programs, which says that such programs are manipulative. By using formative research and TIPs, nutrition counseling is based on beliefs, resource constraints, and decision-making by beneficiaries; it builds self-confidence and empowers families to assure the good health of their children. A final lesson is that such client-based formative research can and should be done in the context of World Bank project development but that it may require additional planning, work, and grant resources.

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ABBREVIATIONS

Lao PDR	The Lao People's Democratic Republic
IMCI	Integrated Management of Childhood Illness
IMR	Infant mortality rate
KAP	Knowledge, attitudes and practices
MDG	Millennium Development Goal
TIPs	Trials of Improved Practices
U5M	Under-five mortality
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

In the Lao People's Democratic Republic (PDR), rates of under-five deaths are high, with 82 children dying per 1,000 children under five years of age. Prevalence of malnutrition is also high with 40 percent of children under five years of age with low weight for their age. If the Lao PDR is to attain the Millennium Development Goals of reducing under-five mortality by two-thirds and underweight by one-half between 1990 and 2015 concerted efforts are needed to implement cost-effective interventions to address these problems. Interventions to improve maternal and newborn care and infant and young child feeding will help decrease under-five mortality and malnutrition in the Lao PDR and other developing countries. To assist with the design of these interventions, research, using quantitative and qualitative methods, was conducted on newborn care, maternal care, and infant and young child feeding practices. This research was conducted in three different areas of the country, with over 300 mothers, other child caregivers and other influential people in communities, belonging to the country's many ethno-linguistic groups. The Trials of Improved Practices (TIPs) methodology was used to determine if mothers and caregivers could follow recommended infant and young child feeding practices.

The results of the research show that the majority women give birth at home, unassisted by a trained health care provider. All the ethno-linguistic groups included in the study have prescribed and proscribed foods for new mothers. These foods vary by region and ethnic group and the length of time the foods are or are not eaten. The reasons for eating or not eating the foods are the same: ensuring the health of the new mother and the production of an adequate quality and quantity of breastmilk.

To mitigate the risk of hypothermia, the international standard is to defer washing the newborn for 24 hours. The majority of Lao infants born at home are washed with warm water after delivery and then wrapped with a clean cloth. Infants born in health facilities are not washed but are immediately wiped and wrapped in a clean cloth, according to the international recommendation. Breastfeeding should be initiated within the first hour after birth to establish breastfeeding, keep the newborn warm through skin-to-skin contact with the mother, and ensure the infant receives colostrum, the micronutrient and anti-body rich first milk produced in the first three days after delivery. The study found mothers first hold their newborns anytime from right after birth to up to three days after birth and only a quarter to half of newborns receive colostrum in the first hour after birth. Reasons given by mothers/caregivers for not feeding the newborn colostrum include *“is not real milk”*, *“is hot, dirty, sour or bad tasting”* and *“is tradition not to give it”*. Some newborns are given pre-lacteal foods and liquids, usually masticated rice or water, instead of colostrum and in one ethno-linguistic group, the newborn is given to another woman to wet nurse. Merely washing the umbilical cord with soap and water and letting it dry is not widely practiced. More often local preparations are put on the cord *“to help it dry”*. Traditional beliefs determine practices but some of these beliefs are changing, due to women receiving more information from health providers and the media about optimal care and feeding practices.

All infants are breastfed for, on average, 2 years, which is recommended internationally; however, other breastfeeding practices need improving. Only one-third of mothers report that they exclusively breastfeed their infants for 4-6 months which was the recommendation in the Lao PDR at the time of the study. In one ethno-linguistic group, all infants are exclusively breastfed and these excellent breastfeeding practices need to be protected and sustained. Women do not exclusively breastfeed for six months because they leave their infants with another caregiver so they can work for long periods of the day, usually to tend to crops in fields that are some distance from their home. In the mother's absence, caregivers give infants masticated rice, water that has not always been boiled, and, in some cases, canned or powdered milk.

In all infant and young child feeding (breastfeeding and giving complementary foods), the mother/caregiver lets the infant and young child determine how much or what he/she eats and the concept of "actively feeding" the child is not understood well. The child's reaction to breastfeeding also may determine when complementary food is introduced; for example, if the baby cries after breastfeeding, the mother often perceives this to mean that her breastmilk is inadequate and therefore introduces other foods. If the infant or young child looks away or closes its mouth after receiving food, the caregiver interprets this as the child being full and stops feeding the child.

All but one ethno-linguistic group introduces complementary foods before the infant's fifth month of life. Most infants receive sticky (and undiluted) rice as their first food. In addition to rice, mothers listed 10 other foods they frequently give to infants and young children and another 10 that are given occasionally. About half of children receive meat (most often buffalo or cow, chicken, pork or frog) but more often fish 1-3 times a day but in small quantities. Traditional beliefs may determine whether a food is given to an infant or young child or not. For example, some groups do not give infants and young children eggs, believing them to be harmful to the child's teeth. Some people believe that eggs and other animal foods will give infants and young children worms, diarrhea and digestive problems. Shellfish, grasshoppers and snails were often withheld from children 6-12 months because these foods are thought to be too difficult for children to eat. The availability of foods is seasonal, particularly for fruits and vegetables, or limited by cost (e.g., meat). While the majority of infants 6-11 months receive the recommended 3 meals a day, less than one-fifth of children 12-24 months receive the recommended 5 meals a day.

TIPs revealed that all but one mothers/caregivers were willing to try one of four recommended young child feeding practices. Although mothers/caregivers were asked to try only one of four feeding practices, many of them tried one or more of the other three as well. Mothers/caregivers were enthusiastic about the results after trying these recommendations and were particularly impressed with the amount and types of food their children could eat if they were coaxed to eat additional food. They also reported, that because of the new feeding practice(s), the children were happier, better behaved and easier to care for which made it possible for the mother to do other work around the house. Most mothers/caregivers said they would continue the recommendations if they could but that their access to certain foods, particularly during certain seasons, might

make it difficult to do so all of the time. To compensate for the limited availability of food on certain days, it was suggested by some women that they could feed the child more of these foods when they were available.

The conclusions of the study are that newborn and maternal care and infant and young child feeding practices can be improved in the Lao PDR. Newborn care can be improved by using low-cost interventions such as keeping the newborn warm by deferring washing for 24 hours, wiping, wrapping and breastfeeding the newborn immediately after delivery, and by simply washing and allowing the cord to air-dry. Most women were not assisted by trained health care providers during delivery or in the postpartum period. Women's health can be improved by increasing the care given by trained birth attendants during delivery and postpartum and increasing the amount and quality of foods consumed by women after delivery. A facilitator for women eating an adequate diet is their belief that foods improve the quantity and quality of breastmilk. For the feeding of infant and young children, TIPs found that the majority of mothers/caregivers were willing to try and continue new feeding practices including giving the child more food, increasing the number of meals the child is fed and increasing or introducing animal foods and fruits and vegetables. These results provide evidence that mothers and caregivers in the Lao PDR are willing and able to increase the amount of energy and essential micronutrients, such as vitamin A, iron, zinc and β -carotene (pro-vitamin A) given to their children. Using the TIPs methodology allowed mothers to give the people designing programs feedback on what they liked about the recommendations and what the barriers and facilitators were to continuing these practices. While used only to investigate child feeding practices, this methodology could also be used for other practices such as newborn care. The results of these findings should be used to develop messages and interventions to improve newborn and maternal care and infant and young child feeding in rural areas of the Lao PDR.

INTRODUCTION

Neonatal mortality and malnutrition in children are un-addressed problems in the majority of developing countries. The major causes of neonatal deaths include: birth asphyxia, complications of prematurity, congenital abnormalities, hypothermia, infections (tetanus, sepsis, pneumonia, diarrhea), and injuries during birth (Save the Children, 2001). Underweight in women, either before or during pregnancy, contributes to the risk of newborns being born with low birthweight (<2.5 kg), which in turn increases risk of infant deaths and developmental problems if the infant survives. Inadequate feeding practices, from birth through two years of age, are the underlying cause of over half of childhood deaths from disease (Pelletier, 1994). Over half of children dying from a childhood illness would not die if they were well-nourished.

In the Lao Peoples' Democratic Republic (PDR) rates of infant and under-five mortality and malnutrition are among the highest in the East Asia and Pacific region (World Bank, 2002). Rates of infant mortality (IMR) were static between 1990 and 2000 at 106 deaths per 1,000 live births (Ministry of Health, 2001; World Bank, 2003). It is encouraging that under-five mortality (U5M) has declined from 170 deaths to 82 deaths over the same period, a 52% decrease. That IMR has remained static but U5M has decreased is evidence that neonatal mortality, which makes up 40 percent of under-five deaths and an even larger proportion of infant mortality, has not changed while deaths in older children have declined.

Rates of malnutrition also have declined, but at a slower pace. A 1993 national survey (Phimmasone, et al., 1996) found that 44 percent of children under 5 years of age were underweight (low weight for age¹) and 48 percent were stunted (low height for age²). The 2000 National Health Survey (Ministry of Health, 2001) found 40 percent of children were underweight, representing a 9 percent decrease since 1993 or a 0.57 percentage point decrease per year. The 2000 survey found 41 percent were stunted, representing a 15 percent decrease since 1993 or a decrease of 1 percentage point per year. The 2000 survey also found 15 percent of children were wasted (low weight for height)³—an indicator that was not collected in 1993.

The Millennium Development Goals (MDGs)⁴ have been established internationally to improve development indicators in poor countries. The MDG of reducing U5M mortality

¹ Defined as 2 standard deviations below the median for the United States/World Health Organization National Center for Health Statistics for weight for age.

² Defined as 2 standard deviations below the median for the United States/World Health Organization National Center for Health Statistics for height for age.

³ Defined as 2 standard deviations below the median for the United States/World Health Organization National Center for Health Statistics for weight for height.

⁴ There are 8 MDGs: 1) Eradicate extreme poverty and hunger; 2) Achieve universal primary education; 3) Promote gender equality and empower women; 4) Reduce child mortality; 5) Improve maternal health; 6) Combat HIV/AIDs, malaria and other diseases; 7) Ensure environmental sustainability; 8) Develop a global partnership for development.

by two-thirds by the year 2015 has been accomplished in the Lao PDR but even more progress could be made if the neonatal mortality and malnutrition were also reduced.

While underweight in children has declined, there has only been a 9 percent decrease from 1993 to 2000 and the Lao PDR is, in fact, considered a country that performed unsatisfactorily in making progress toward halving underweight in children (Chhabra & Rokx, 2004). To achieve the MDG on nutrition, underweight in children needs to decrease from 44 percent of children with underweight (low weight for age) in 1993 to 22 percent in 2015. This would require a decrease of 1.2 percentage points per year between 2000 and 2015. Urgent action is needed in the Lao PDR to attain these ambitious goals.

To help in developing and implementing cost-effective interventions to reduce under-five mortality and malnutrition, the World Bank supported a study to investigate ways to improve newborn care and infant and young child feeding practices in three provinces and three ethno-linguistic groups in Lao PDR. Field research was conducted in two phases. In Phase 1 information was collected on newborn and maternal care practices and infant and young child feeding practices. The research identified facilitating factors and barriers to following ideal practices that could be used to develop counseling messages to improve practices. In Phase 2, mothers and caregivers were asked to try one of four infant and young child feeding recommendations based on practices identified in Phase 1 that needed improving to increase intake of energy and essential micronutrients such as vitamin A, iron and zinc.

METHODOLOGY

PHASE 1

Site and Sample Selection

Houaphanh province in the north and Savannakhet and Champassak provinces in the south were selected for the research which took place in 4 villages per province. These provinces were chosen because they are ethnically, linguistically, and geographically representative of most of the country. There are almost 50 ethnic groups in the country. In the past, they were grouped into three categories based on geographical location. More recently they have been grouped by ethno-linguistic group. The mothers participating in this study were from three of the country's four broad ethno-linguistic groups: Tai-Kadai, Austro-Asiatic, Hmong-Yao and this is how they are referred in this study although they have, in the past, had other designations⁵. Village selection criteria included: 1)

⁵ The Lao Loum or "lowland Lao" (often called the Lao) speak languages of the Tai-Kadai family, make up about 60% of the population of the country and generally inhabit the fertile river valleys. Another 30% of the population speak Austro-Asiatic languages. Because they lived in hilly terrain at elevations between 500-1,000 meters, this group was referred to as the Lao Theung, meaning literally "middle elevation Lao". Living at 1,000 meters and above were the Lao Soung or "highland Lao". This group spoke both Hmong-Yao languages, comprising 7.4% of the population, and Sino-Tibetan languages, making up about 2.7% of the population. There were no Sino-Tibetan Lao included in this study. To reduce slash and burn

accessibility by road in the rainy season; 2) a village size of at least 300 families; 3) a majority population of Tai-Kadai in 2 villages in each province and a majority population of either Austro-Asiatic or Hmong-Yao in the other two villages in each province; 4) relative poverty as identified by provincial officials; and 5) no project on improving newborn care and nutritional status of children was currently or had been implemented recently in the village.

Technical Assistance

An anthropologist and nutritionist provided technical assistance in developing research instruments, training, field work and analysis of the findings. UNICEF staff assisted with developing research instruments by providing information about infant and young child feeding practices in the Lao PDR.

Staff Selection and Training

Twenty-one college graduates, conversant in English were interviewed for research staff positions, and 12 were selected to participate in an intensive 4-day course that included training on child nutrition, use of the research instrument and survey and interview methods. Based on their performance, 9 people were chosen to conduct the research—3 for each province—and assigned as surveyors (responsible for short-answer survey instrument), interviewers (responsible for exploratory and probing interviews) or supervisors (responsible for overseeing the work of surveyors and interviewers and conducting village-level surveys). Some staff attrition occurred before research began and, as a result, replacements were identified, trained and added to the teams.

Research Instruments

The research instruments were designed to collect information on the village, assistance given to women during childbirth, newborn care, women's postpartum eating habits, and newborn and child feeding. The focus was on practices that could be changed at the community level. For newborn care these included: delaying washing for 24 hours, wiping, drying and keeping the newborn warm, immediate breastfeeding, withholding pre-lacteal feeds, giving colostrum, and clean care of the umbilical cord⁶. For child feeding these included: exclusive breastfeeding for 4-6 months, timely introduction of complementary foods at 4-6 months⁷, and adequate quality and quantity of food fed to children 6-24 months with continued breastfeeding until 24 months. Use of vitamin and mineral-rich foods—e.g., fish, meats, pulses, insects, eggs, milk, fruits and vegetables—

agriculture practices, the Lao government has relocated people living in mountains and the terms Lao Theung and Lao Soung are less appropriate but are still used by some.

⁶ Note that child feeding practices in the first three days of life are classified here under newborn care since these practices not only affect the nutritional status of the child but are also proxies indicating whether the infant is being kept warm and for the risk of early infections.

⁷ It is now policy in Lao PDR to introduce complementary foods to infants at 6 months, in keeping with new international recommendations, but at the time of the field study the recommendation was to introduce foods at 4-6 months. Ideal practices were based on the Lao PDR recommendations at the time.

were used as proxies for the quality of diet for children 6-24 months of age. These feeding practices are based on international recommendations (WHO 1998).

A knowledge, attitudes and practices (KAP) survey form was used to gather quantitative data on current practices and an interview guide was used to obtain qualitative information on practices and the reasons for those practices. Several additional instruments (Perceptions of a Healthy Baby, a simplified qualitative 24-Hour Recall for children 6-24 months, Food Exploration, Observations in the Home, and Village Survey, Free Listing of Foods and Child Caregiver Interview) were used to complement, confirm and further explain findings from the KAP survey and Interviews. A description for each method is shown in Appendix A and described in greater detail elsewhere (Blum, et al., undated). Interview forms were translated into Lao and tested by field staff in mock interviews in three villages in rural Vientiane Province over a two-day period. Based on this testing the research instruments were revised and additional training was given to field staff to use revised research instruments.

Sample Size

Table 1 shows the total number of each research instrument administered by province and ethno-linguistic group.

Table 1: Number of Instruments Administered by Research Teams in Phase I

Instrument	Numbers to Whom Instrument Administered							
	Total	Houaphanh Province			Savannakhet Prov.		Champassak Prov.	
		Tai-Kadai	Austro-Asiatic	Hmong-Yao	Tai-Kadai	Austro-Asiatic	Tai-Kadai	Austro-Asiatic
KAP survey	333	49	33	17	60	60	60	54
Mother Interview	67	12	9	3	9	11	15	8
Father Interview	12	2	1	1	2	2	2	2
Other Interview	36	6	6	1	6	6	8	3
Child caregiver Interview	43	12 (ethno-language group not asked)			16		15	
Healthy Baby	39	7	5	2	5	6	9	5
24-Hour Recall	123	21	14	6	22	20	20	20
Food Exploration	110	14	14	6	21	20	19	16
Observations in the Home	79	(ethno-language group and province not recorded)						
Village Overview and Free Listing	16	1	---	2	2	3	2	4*
		2 mixed villages						

Logistics

The Leading Committee for Rural Development in the Prime Minister's Office provided letters to ensure collaboration between the research team and officials at provincial, district and community levels. The Central Ministry of Health assisted by contacting provincial Departments of Health before the research team visited each province to introduce the research and make arrangements for the field work. Two village helpers were hired in each village to assist in finding the mothers needed to interview or survey and to provide translation, where necessary. In each village the Headman appointed or suggested people to fill this role. Research took place between May and September 2001.

PHASE 2

Site and Sample Size Selection

Houaphanh and Champassak provinces were chosen as field sites for Phase 2 because these provinces showed the greatest contrasts in feeding practices in Phase I. Within each province 1 Tai-Kadai village and 1 village where another ethnic group lived were chosen to conduct Trials for Improved Practices (TIPs), as described in detail elsewhere (Dickin, et al., 1997). Briefly, the methodology for TIPs included the following--within each village, about 15 mothers or caregivers of children 6-24 months of age were asked to try 1 out of 4 child feeding recommendations and after 4 days were visited again and asked if they tried the new practice, what they liked or did not like about it and if they would be willing to continue using the practice. The numbers of Tai-Kadai, Austro-Asiatic and Hmong-Yao mothers and caregivers participating in Phase II were 30, 29 and 5, respectively.

Selection of Recommendations for TIPs

Newborn care practices were not included in the TIPs because it would be time consuming and costly to find enough women who were about to deliver so they (or those assisting during childbirth) could try recommendations for newborn care at delivery. Child feeding recommendations were based on problem areas for essential practices determined during the first phase of research. The following feeding recommendations for children 6-24 months were investigated using TIPs:

- give some or give more animal foods daily (includes meat from domestically-raised animals, purchased or collected sources including wild meat from the forest or fields such as frog and mouse and river such as fish);
- give more food per meal and encourage the child to eat it;
- give food 3 to 6 times per day; and
- give vegetables and/or fruits daily.

Increasing the amount of energy, animal foods, fruits and vegetables and the number of meals infants and young children 6-24 months receive are best practices to reduce underweight, stunting and micronutrient malnutrition. Animal food are limited in many developing countries by cost, but they are the only dietary source of essential nutrients such as vitamin A (as retinol) and zinc, both which have been found to reduce the

severity of a number of different infections, and meat provides the only good bioavailable source of iron which is needed to generate energy, for proper brain development and immune function. Fruits and vegetables are needed for good health. Yellow, orange and green fruits and vegetable are good sources of β -carotene, which is a precursor to and converted to retinol when there is a physiological need for it.

The number of mothers/caregivers from each ethnic group trying each recommendation is shown in Table 2.

Table 2: Number of Mothers/Caregivers Participating in the Trials of Improved Practices for Each Feeding Recommendations (Phase II)

Province, Ethno-linguistic group, total # mothers	# mothers/ caregivers trying recommendation to give more animal food/day	# mothers/ caregivers trying recommendation to give more food/meals and encourage	# mothers/ caregivers trying recommendati on to give food 3-6 times/day	# mothers (or caregivers) trying recommendation to give vegetables and/or fruits daily
Champassak, Austro-Asiatic, 14 mothers/care- givers	6	3	3	2
Champassak, Tai-Kadai, 17 mothers/care- givers	2	5	4	6
Houaphanh, Austro-Asiatic, 15 mothers/care- givers	5	3	4	3
Houaphanh, Tai-Kadai, 13 mothers/care- givers	4	5	3	1
Houaphanh, Hmong-Yao, 5 mothers/care- givers	2	1	1	1
64 mothers/care- givers trying each recom-mendation	19	17	15	13

Administering TIPS

During September, three visits were made to each mother or caregiver. The first visit was used to determine what and how the child was being fed, using the 24-Hour Recall

method. Based on the Recall interviews, the researchers determined which of the 4 recommendations was most appropriate for that mother or caregiver to try. The mother/caregiver decided what specific actions she/he would take to try the recommendation. For example, she/he might be asked to increase the number of times food was given to the child from 3 times to 5 times a day and would then decide to do it by feeding the child an additional snack every morning and every afternoon. Mothers/caregivers were told that staff were seeking their assistance and advice on new methods of feeding children. They were asked not to purchase food especially for the trial but to use food from their usual sources, to include rivers, streams, forests and rice fields.

The field staff returned the following day to ensure that each mother/caregiver understood what she/he was supposed to do to try the assigned recommendation and four days later the field staff returned again to administer a second 24-Hour Recall and discuss the results of the TIPs with the mother/caregiver. The mother/caregiver was asked what changes they had made in feeding the child and why, the cost of making the changes (e.g., time and other resources), the effect the new practice had on the child and any problems encountered in following the new way of feeding. Mothers/caregivers also were asked if they would continue following the new way of feeding they tried, their opinion and the opinion of other family members of the change in feeding practices, and their willingness to recommend the new way of feeding to others.

RESULTS

PHASE 1

The KAP results are presented quantitatively as percentages while interviews and other qualitative data are presented in qualitative wording (e.g., most, a few, a third, over half).

Information on Villages and Parents

In each province 1 or more of the selected villages had too few children under 2 years of age, so that the teams had to complete their research in neighboring villages with the same ethnic composition. Research was therefore conducted in 18 instead of 12 villages.

The age of mothers and fathers participating in the KAP survey ranged from 16-48 years (median 26 years) and 18-67 years (median 30 years), respectively. Twenty-seven percent of mothers and 9 percent of fathers had no education while 45 percent of mothers and 39 percent of fathers had an elementary school education. The remaining mothers and fathers had varying amounts of secondary and/or trade school education.

In the KAP survey 74 percent of fathers and 72 percent of mothers listed their occupation as farmers. Fifteen percent of fathers said they were government employees, 8 percent of mothers said they were housewives, and 4 percent of fathers and a smaller percentage of mothers said they worked in some kind of business. About 10 percent of mothers said that they worked in some combination of these occupations. As would be expected, the

proportion of those working outside the village was highest in villages close to urban areas.

All villages had both well-off families, defined as those having sufficient rice to last the year, and poorer families, defined as those that do not have enough rice to last 12 months. Some villages trade animals, mainly buffalo and pigs, as well as forest products and weaving. Trade was usually with the nearest market, but, in some cases, products were traded as far away as the capital city of Vientiane.

Amenities available in the villages varied. Ten villages had 24-hour, year-round supply of electricity and three had electricity for just part of the day or year. Four villages had no electricity and for one village there was no information on the availability of electricity. Although most of the villages listed more than one source of water for drinking, bathing and washing, 8 relied primarily on wells while two had access to well water only part of the year. Three relied primarily on spring water, 3 relied primarily on a stream or river, and for 2 villages there was no information on the water source. The main sources of water listed in the KAP survey were wells (45 percent) and pumps (19 percent). Mothers spent from less than 15 minutes per day collecting water (in 49 percent of cases) to 15-30 minutes (25 percent). The remaining 26 percent spent more than 30 minutes per day collecting water.

Twelve villages had an elementary school with only 2 grades, 6 villages had a complete elementary school within walking distance. All the villages had people with some medical or health experience including birth attendants, village health volunteers, village "nurses" and "doctors", and traditional healers. Some of these people had some formal training. The nearest clinic or hospital to villages varied, ranging from a distance of between 3 to 200 kilometers away.

Headmen named from 19 to 55 food items available locally, with the median being 49 food items. Five villages showed a heavy dependence on markets and "mobile sellers"—food sellers who come to the village--getting from a fifth to half of foods on their list from these 2 sources. Another 6 villages purchased only meat from a market, and another 5 did not use either a market or mobile seller as a source of food. In most every village, foods collected from the forest, river, creek or stream were the major source of food at the time of the study.

Birth Practices

Data from the KAP survey indicated that 84 percent of women give birth at home with rates of home deliveries highest among Austro-Asiatic women (90 percent) and in Champassak province (90 percent). These high rates of home deliveries are confirmed in interviews with women and their families. Hospital deliveries are highest among the Tai-Kadai (12 percent of all births) and in Houaphanh Province (15 percent of all births).

Ninety percent of women have someone present when they deliver. Birth attendants assist in 25 percent of births (though none among the Hmong-Yao), doctors in 20 percent of

births, and combinations of relatives and birth attendants in the rest. Husbands participate in twice as many births as women's mothers among all groups except the Hmong-Yao.

Postpartum Practices

Immediately after giving birth Tai-Kadai mothers traditionally rest with a fire under their bed lasting for from a few days to several weeks. Some fast during this period, while others eat special foods that are easy to digest and thought to give them strength and improve the quantity and quality of their breastmilk. In all 3 ethno-linguistic groups, new mothers are often prohibited from eating foods believed to be bad for them or harmful to the quantity and quality of their breastmilk and hence harmful to the baby.

Although the mothers' interviews produced answers with considerable variation in the types of food they eat immediately after they deliver, even within the same ethno-linguistic group in the same province, there are several foods that new mothers commonly should and should not eat. Rice with salt and ginger, chicken, and "boiled root water" are staples allowed in the diet. The meat of white buffalo, white pig, and wild animals, panai fish, rotten, spicy, sour or raw foods and un-boiled water and cold drinks are universally reported as prohibited. These foods are believed to decrease breastmilk supply and to be harmful to the mother's health. In Houaphanh it is believed these foods make the mother sick, weak or thin. In Savannakhet and Champassak, these foods are considered so dangerous that the "allergy" they cause, manifested by dizziness, bleeding, stomachache and/or headache, may lead to the mother's death. Only 1 of 57 mothers said she ignored the rules and ate everything.

The foods eaten and avoided by a nursing mother are almost identical to the foods eaten and avoided by a woman who has just given birth. In addition, the nursing mother also is urged to eat soups and drink a lot of liquid - especially boiled root water - and avoid dry meat and fish. Whether a food is promoted or restricted depended entirely on its considered effect on the quantity or quality of breastmilk (and the effect of that milk on the child's digestion) and/or its effect on the mother's health. For example, a breastfeeding mother cannot eat "rotten, fermented, oily, sour, raw or spicy food", some meats, bamboo, jack fruits or pumpkin because "baby might get stomachache" or "digestive problems". "Beware of foods that are against the health: frogs will spoil the baby's stomach, sour foods will give the baby a stomachache." Women mention other practices linked to breastmilk supply. For example, 9 women in Savannakhet, 7 in Champassak and 4 in Houaphanh said an injectable contraceptive, Canbairon, increases breastmilk supply.

Newborn Care

Most newborns are washed with warm water after delivery with the exception of those born in a hospital where, mothers/caregivers report, the practice is to wipe the baby with a dry cloth and then wrap it immediately, without bathing, to keep it from getting cold. In the two southern provinces, wrapping the newborn is also practiced to protect the baby from flies. The reason given for washing the newborn at home is to make him or her

clean by removing tallow and blood. Mothers and caregivers say they first hold their baby at different times after birth, from immediately afterwards to up to 3 days after birth.

The umbilical cord is usually washed with warm water and occasionally soap is used. Preparations applied to the cord are reported to help it dry, heal and protect it from infection and include *kui hai* (soot scraped from a burnt wooden rice steamer) in Houaphanh, wasps' nest in Champassak and wax or burnt black cotton in Savannakhet. A few mothers/caregivers use baby powder on the cord or alcohol, ampicilin or other medicines.

When asked what problems babies have right after they are born, many mothers/caregivers seemed to think they were being asked what problems their own child had, so many answered "*none*." Other mothers said babies can "*catch cold*" or contract another infectious disease (e.g., measles or dysentery) or become severely under-nourished. When the baby is sick, most mothers use home remedies or medicine from a pharmacy, take the baby to village health personnel including the magic herbalist "*who casts spell to a child*" or, often as a last resort, take the baby to the hospital.

Only one-third of mothers receive advice or help with breastfeeding when they begin nursing. Best or ideal practices for early breastfeeding particularly important to the newborn—immediate breastfeeding, withholding pre-lacteal foods and giving colostrum—are reviewed in Table 3.

In the interviews half of mothers say they feed their infants within 1 day after birth and half do not give any pre-lacteal foods or liquids (two-thirds in Houaphanh, half in Champassak, and one-third in Savannakhet) while nearly two-thirds of mothers give their newborn colostrum at some point during the first three days when colostrum is produced (two-thirds in Houaphanh and Savannakhet and half in Champassak). By ethno-linguistic group, about half of the Tai-Kadai and half of the Austro-Asiatic withhold pre-lacteal foods and liquids while all the Hmong-Yao do so. All Hmong-Yao infants receive breastmilk within 1 day after birth but none receive colostrum because infants are fed by a wet nurse and not their mother. Fewer Austro-Asiatic and Tai-Kadai infants are breastfed immediately after birth but about two-thirds receive colostrum in both these ethno-linguistic groups.

Table 3: Summary of Information on Early and Exclusive Breastfeeding

<u>Ideal Practice</u> Actual Practice	<u>Facilitators to promoting ideal practice:</u>	<u>Barriers to achieving ideal practice:</u>
<u>Early/Immediate breastfeeding.</u> Half of interview mothers, 27% of all KAP mothers breastfeed less than 1 day after birth (among the Hmong-Yao 91% breastfeed less than 1 day; among the Hmong-Yao and some Austro-Asiatic, a wet nurse feeds newborns, not the mother; based on the KAP, 25% of the Tai-Kadai and Austro-Asiatic breastfeed newborns less than 1 day after delivery).	<ul style="list-style-type: none"> • The majority of mothers deliver at home (84% in the KAP survey mothers) and the baby stays with the mother and can be breastfed. • Some mothers feel compassion for the crying child and give him/her breastmilk. • Acceptance by some mothers - and those who influence them - of advice that early breastfeeding stimulates mother's production of breastmilk and is good for the mother, helping her womb recover. 	<ul style="list-style-type: none"> • Custom among all groups of waiting until mother's "real" milk comes in; the Hmong-Yao believe that colostrum is bad for the baby so a woman who is not the mother wet nurses the newborn until the mother's milk comes in.
<u>Withholding pre-lacteal foods and liquids.</u> Half of interview mothers, 29% of KAP mothers do not give pre-lacteal foods, liquids (by interviews all the Hmong-Yao, and half of Austro-Asiatic and Tai-Kadai and by KAP survey 59% of the Hmong-Yao and 25% of the Tai-Kadai and Austro-Asiatic).	<ul style="list-style-type: none"> • Acceptance by some mothers - and those who influence them - of advice from birth attendants, health professionals not to give pre-lacteal food. • Custom among Hmong-Yao to not give pre-lacteal food. • Some newborns will not eat food and prefer breastmilk. 	<ul style="list-style-type: none"> • Custom among Tai-Kadai, Austro-Asiatic of feeding pre-lacteal food, usually masticated rice, liquid, usually water, while waiting for mother's milk. • Belief that pre-lacteal food will not harm and may even be good for baby. • Belief that newborn does not know how to suck, must be given drops of water first.
<u>Giving colostrum.</u> Nearly two-thirds of interview mothers but only 40% of KAP mothers give colostrum. (No Hmong-Yao give colostrum because the child is fed by a wet nurse; two-thirds of Tai-Kadai and Austro-Asiatic give colostrum some time during the first 3 days after birth.)	<ul style="list-style-type: none"> • Acceptance by some mothers - and some of those who influence them - of advice from medical personnel, birth attendants to give colostrum. 	<ul style="list-style-type: none"> • Impression of colostrum as hot, dirty, sour, bad tasting, bad for child's stomach. • Belief that colostrum blocks "real" milk from coming in. • Hmong-Yao custom of using a wet nurse until mother's "real" milk comes in.
<u>Exclusive breastfeeding.</u> A third of interview mothers and 30% KAP mothers report feeding their child breastmilk exclusively until the age of 4-6 months (all the Hmong-Yao, a third of Tai-Kadai and a fifth of Austro-Asiatic).	<ul style="list-style-type: none"> • Acceptance by some of medical advice that breastmilk is good for child. • Some mothers have no one to leave their child with and take child to work with them, and continue to breastfeed. • Some mothers believe their breastmilk is sufficient and their child is content with it. • Some feel that breastmilk helps avoid diarrhea, is good for baby in other ways. • Fathers want to avoid expense of canned milk. 	<ul style="list-style-type: none"> • Tai-Kadai and Austro-Asiatic custom of introducing non-breastmilk liquid or food early. • Mother returns to work, leaves child in care of another - child must be fed. • Mother's idea that all breastmilk - or hers - is not enough usually because baby cries, that child needs rice, water, powdered /canned milk. • Mothers' beliefs that infant needs rice, "child is not full until he/she is fed rice."

The KAP Survey responses for following all three practices are consistently lower except among Hmong-Yao. Just 27 percent of all mothers breastfeed their infants within 1 day after birth and 29% withhold prelacteal food. Among the Hmong-Yao, 91 percent of infants receive breastmilk within 1 day after birth, albeit from a woman who is not the mother, and 59 percent do not receive pre-lacteal foods or liquids. Only 25 percent of both Tai-Kadai and Austro-Asiatic infants receive breastmilk on the first day (compared to half in the interviews) and about the same proportion do not receive pre-lacteal food or liquids (compared to a half in the interviews). When asked whether they give colostrum, about 40 percent of all mothers answered “yes.”

To satisfy the baby’s hunger, Hmong-Yao mothers use a wet nurse but do not give food while the other two ethno-language groups give water or rice which is believed to help the baby grow strong and fast. *Khaomok*, chewed sticky rice wrapped in a banana leaf and steamed, is often the preferred pre-lacteal food. Others believe that the baby does not know how to suck and must be given drops of water to practice sucking before he or she breastfeeds.

Barriers to following the three practices are similar. There is a belief among the majority of all 3 groups that breastfeeding should only begin when the “real milk” comes in (for 2-4 days after birth). Mothers, fathers and other key informants from all three ethnic groups believe the first milk, colostrum, should be discarded because it is tradition to do so and because it is hot, dirty, sour and bad tasting, causes stomachache and diarrhea, and blocks the real milk from coming in.

Facilitators to early breastfeeding are that some mothers and other key informants have heard about the benefits of “new” practices (from doctors, nurses, birth attendants and radio messages) and are willing to follow the advice about breastfeeding within 1 hour after birth, withholding pre-lacteal food and liquids and give colostrum. In the KAP survey, 33 percent of mothers say they receive advice about child feeding from a health worker, including trained traditional birth attendants. One father said, *“It was told by a nurse that breast should be sucked right away to cause a lot of breastmilk to come in.”* One birth attendant advises that breastfeeding should begin 20 minutes after birth *“to encourage womb waste to come out soon”* and another advises that breastfeeding right away will *“give the child practice sucking the breast.”* Both mothers receiving this advice fed their babies soon after birth. Some fathers have learned that feeding anything but breastmilk may cause infection: *“First 2-3 days, children shouldn’t be fed with chewed cooked rice because it will harm children’s stomachs”*.

Additional facilitating factors are that the majority of all births are at home and most babies are not taken away from the mother (except the Hmong-Yao newborns who are given to a wet nurse), and some mothers feel compassion when the newborn cries and respond by nursing him or her. An additional facilitator is that some babies prefer the breast and will not eat pre-lacteal rice when offered.

Child Feeding Practices

Exclusive Breastfeeding

Three-fourths of mothers are given advice by someone about how and what to feed their child after birth and during the first few months. Some advice is positive but some is based on traditional beliefs that do not support exclusive breastfeeding (only breastmilk and no other foods or liquids including water) and other recommended child feeding practices. Practices, barriers and facilitators for exclusive breastfeeding are reviewed in Table 3.

A third of mothers interviewed say they practice exclusive breastfeeding to 4-6 months. All Hmong-Yao mothers report that they breastfeed exclusively to 4-6 months while just over a third of Tai-Kadai mothers and a fifth of Austro-Asiatic mothers say they did so. In the KAP survey 50 percent of mothers regularly give liquids other than breastmilk before their infants are 1 month old and 71 percent of mothers give liquids before 4 months. Although 24 percent of mothers give solid food regularly before 4 months, 62 percent do not do so before 6 months.

The main barrier to women exclusively breastfeeding for all three ethno-linguistic groups is the need to return to work for long periods during the day (often 10-12 hours), usually to tend crops in the fields or to look for food. Infants are left with another caregiver during the day and given food and in a few cases (in order of frequency) un-boiled water, powdered milk and canned milk. Mothers also report that when their babies cry after being breastfed that this is a sign that their breastmilk is inadequate in quality or quantity: *“Breastmilk not enough to fill the baby”*. Some mothers believe the *“child not full till he is fed with rice”* and that rice and breastmilk are the best combination: *“if eat rice together [with breastmilk] child get fat and healthy”*.

A major facilitator for exclusive breastfeeding in the Hmong-Yao is tradition. While colostrum is not valued in this group, breastmilk is and most infants are breastfed exclusively from birth. For the other ethno-linguistic groups, there is a willingness of mothers (and caregivers who support them) to exclusively breastfeed if they are able to and if they are given a good reason for doing so. For example, the Tai-Kadai in Houaphanh do not give chewed, sticky rice to young children as frequently as in the past because they are receiving advice not to from medical professionals: *“a child shouldn’t be fed with rice—a nurse said he should be fed only with breastmilk until 4 months”* and *“exclusive breastfeeding should be practiced to avoid diarrhea”*. Another facilitator for exclusive breastfeeding is economy. As two fathers note: *“breastmilk is good and there isn’t money to buy tinned milk”* and *“child drinks breastmilk and becomes vigorous. If fed tinned milk he won’t be strong and the milk will be too expensive”*.

Some mothers have no other caregiver to leave their infant with so they take the infant with them to the fields and continue to breastfeed. Some mothers express confidence in their ability to produce good quality milk for as long as the child wants to nurse: *“if mother is healthy she will feed her child breastmilk until the child stops drinking”*

himself” and “mother does not mean to stop the child drinking breastmilk. It usually depends on the child—the child stops himself”. Some also recognize that young infants cannot tolerate foods: “Daughter doesn’t like to eat chewed rice and other food—is against the stomach”.

Continued Breastfeeding for 2 Years

Mothers interviewed report that breastfeeding is stopped completely from between 5 months to 4 years but, on average, continues until 18 months among the Hmong-Yao, 18-24 months among the Tai-Kadai and 12-24 months among Austro-Asiatic. The KAP Survey found that 23 percent of children under 24 months are no longer being breastfed.

The barriers to mothers breastfeeding until their child is two years of age are numerous and include the following: mothers become pregnant again (“*it is believed breastmilk is no longer good*”); mothers want to return to their regular diet instead of restricting certain foods (“*Mother who is breastfeeding must avoid eating certain foods and after awhile she wants to eat those foods again*”); mothers’ health (“*breastfeeding past 1 year weakens the mother, make her tired*”); mothers’ beliefs that breastmilk loses nutritional value (“*milk loses its nourishment after 1 year*”); mothers’ beliefs that when a child can eat other food, breastfeeding should be stopped (“*child has teeth and can eat other food*”); child no longer wants to breastfeed (“*child decides to stop breastfeeding*”); and mothers’ milk dries up during periods of heavy work (i.e., planting season) when they are away from their babies.

For most, however, breastfeeding until the child is 2 years of age is the custom and this is the main facilitator to breastfeeding for two years. In addition, most families can not afford breastmilk substitutes such as canned and powered milk or formula so breastfeeding is the only option.

Introduction of Complementary Foods at 4-6 Months

Many children in the sample, according to interviews with mothers, are being fed complementary foods before 4-6 months. The one exception to this is among the Hmong-Yao in Houaphanh. In fact *khaomok* or masticated rice, the most common first food, is introduced at birth by many mothers and caregivers in Savannakhet and Champassak. The KAP survey found that just 28 percent of all mothers wait to introduce foods until between 5-6 months (27 percent of Tai-Kadai mothers, 25 percent of Austro-Asiatic and 63 percent of Hmong-Yao). (These percentages do not include pre-lacteal foods that are given immediately after delivery to substitute for colostrum.) All children between 6-24 months are getting some food—if only rice, according to the results of the 24-Hour Recall interviews.

The major barrier to the timely feeding of complementary food is that some parents do not believe that children can digest food and will get a stomachache, diarrhea and intestinal parasites. A factor facilitating this practice is that of following the child (“*the child sees mother eating and child wants to eat too*”) and (“*baby grabbed from mother, so she let him eat*”).

The Quality and Variety of Foods Consumed by Children

The results from the 24-Hour Recall interviews are shown in Table 4. Sticky rice comprises the major portion of the diet of most children. In Houaphanh in the North, 19 other foods are listed as also fed to children but only 9 are listed by more than one mother. In Savannakhet in the South, 24 foods are listed in addition to rice but only 13 are listed by more than one mother while in Champassak in the far South, 21 foods are listed in addition to rice but only 11 are listed by more than one mother. Half of children also receive grilled or boiled meat (most often frog, chicken, buffalo or cow and pork) but more often fish 1-3 times per day but most receive it in small quantities and in many cases meat is chewed by the caregiver before it is given to the child. Fish, meat or vegetable soups are made for the family but often only the broth is given to children.

No questions were asked about adding fat to the child's diet although in Houaphanh and Savannakhet several children received fried vegetables. There is anecdotal evidence, however, that Tai-Kadai diets include little oil or fat. Hmong-Yao cook with and eat pork fat, although how often or much of these foods are used is not known. Facilitators for children receiving fats and oils include the fact that some source of fat is available in every part of the country. Among these are peanuts, nuts, seeds, coconuts and fish.

Table 4: Foods Given to Children 6-24 Months in Previous 24 Hours

Houaphanh (n=35)					
Type and frequency of food	Number of children given food	Type and frequency of food	Number of children given food	Type and frequency of food	Number of children given food
rice - 1 x in 24 hrs	1	fish, meat, frog, etc 1x	8	canned milk 2 x in 24 hrs	1
rice - 2 x in 24 hrs	4	fish, meat, frog, etc 2x	8	noodles	2
rice - 3 x in 24 hrs	30	fish, meat, frog, etc 3x	3	cookies, cake	10
rice soup - 1x in 24 hr	1	fish, meat, frog, etc 4x	1	banana	11
fish or meat soup 1x	7	egg - 2x	1	plum	1
fish or meat soup 2x	4	fried veg, unspecified	2	mango	3
fish or meat soup 3x	2	veg, unspecified, 3x	1	melon	1
veg soup - 1x	6	sweet potato	1	jackfruit	1
veg soup - 2x	3			"fruit"	1
				mak manh	4
				prickly pear	1
Savannakhet (n=42)					
Type and frequency of food	Number of children given food	Type and frequency of food	Number of children given food	Type and frequency of food	Number of children given food
rice -	3	fish, meat,	5	soymilk	1

1 x in 24 hrs		frog, etc 1x			
rice - 2 x in 24 hrs	7	fish, meat, frog, etc 2x	14	condensed milk 3x	1
rice - 3 x in 24 hrs	25	fish, meat, frog, etc 3x	17	condensed milk 4x	2
rice - 4 x in 24 hrs	3	grilled insect	2	bread, 3x	1
powdered rice in warm water	1	egg 1x 24 hr	6	Lao bread	1
Sweet rice flour soup	1	egg 2x 24 hr	3	cookies, cake, candy	12
Noodle soup	1	Cucumber	3	steamed rice and banana	1
fish or meat soup 1x	1	morning glory	1	banana	14
fish or meat soup 3x	1	Cabbage	1	rambutan	5
veg soup	6	bamboo	8	mango	6
		boiled gr veg	2	papaya	4
		fried veg	2		
Champpassak (n=40)					
Type and frequency of food	Number of children given food	Type and frequency of food	Number of children given food	Type and frequency of food	Number of children given food
rice - 1 x in 24 hrs	3	fish, meat, frog, etc 1x	7	canned milk 2x	1
rice - 2 x in 24 hrs	12	fish, meat, frog, etc 2x	8	canned milk 4x	1
rice - 3 x in 24 hrs	22	fish, meat, frog, etc 3x	10	milk 3x	2
rice - 4 x in 24 hrs	1	morning glory	1	ice cream	1
rice - 5 x in 24 hrs	1	Mushrooms	1	bread	2
Rice soup - 1x	2	Cucumber	1	cracker	4
Rice soup - 2x	2	banana	10	a sweet	3
Fish or meat soup 1x	8	rambutan	4	Pepsi, other soft drink	2
Fish or meat soup 2x	3	mango	4		
Fish or meat soup 3x	4	Sugar cane	1		
noodle soup	1	Durian	1		
		Pineapple	4		

Among the barriers for not feeding foods of high quality to young children are the beliefs that these foods should not be fed to them. In some areas, eggs have a particularly bad reputation: “*may cause cough or parasites, afraid of diarrhea, afraid it may lead to tooth disease, too fatty*”. Eggs are also believed by certain groups in all three provinces to be

harmful to the child's teeth if given before those teeth are fully formed and cause stomachache, worms, diarrhea, and other digestive problems. Some believe eggs cause difficulties with the child's speech. One mother commented that eggs can "*cause a child to become stubborn*". However, mothers and caregivers did say that eggs can be fed to children if there was nothing else available.

Dairy products are rarely consumed because they are not part of Lao culture, although some families are now buying canned or powdered milk. Some animal foods were generally withheld from children of 6-12 months including shellfish, grasshoppers and snails because they were viewed as being too difficult for these children to eat. Some caregivers said that certain fruits and vegetables could not be consumed by children 6-12 months but there was no consistent pattern for these beliefs across ethnic groups or provinces. Some children in all villages had received either fruits or a vegetable in the 24 hours before the survey.

More than one person interviewed noted that "*in reality the family's income cannot afford to provide this kind of (high quality) food to the child*" and parents who said they feed such food are in fact providing the researchers with "*wish lists*" of food. From the KAP survey the researchers learned that all or part of a family's diet may come from the forest. Fifty-four percent of families also give the river as a source of food. This makes it difficult to ensure the supply of certain high-quality foods, particularly foods collected from the bush or forest, on a year-round basis. A few domestic animals, particularly chickens, are raised by some households, but they are not eaten often. Chickens are not penned so not all their eggs are used.

The fact that many mothers are interested in the nutritional content of their children's diet, as found in the Food Exploration exercise, facilitates children receiving high quality foods. Among the reasons given for feeding food with good nutrition are that these foods provide "*vitamins, nutrients, protein and carbohydrates*", are "*good for the digestion*", "*make the child fat, strong and grow quickly*" and are "*good for eyes and blood, makes child grow quickly*". Parents are willing to try new foods. One father commented, "*try to feed rice, only if they don't eat rice, we'll try to feed them with meat.*" The Healthy Baby exercise shows that parents have some understanding of nutrition and infant feeding. On viewing a picture of a healthy baby and asked what the baby is fed, some parents respond that it is fed with "*breastmilk, vitamins, meat, fish, vegetables and fruits*" and "*healthy food, enough food, nutritious, good quality food, is given different kinds of foods.*"

The Amounts of Food Given to Children

In addition to the kind of food given, mothers and caregivers were asked about the amount of food given to young children during two age periods—6-11 months and 12-24 months—(see Table 5). The amount of food given at the main meal appears inadequate. In interviews, mothers usually spoke of amounts as a "handful" (either the mother's or the child's hand), a "finger" (the usual measurement for meat and dried fish) and "a

piece the size of an egg”. The amount of food fed to older children seemed to be greater than that being fed to the younger age group.⁸

Only about a third of mothers report providing their child with his or her own dish, which is recommended so the mother/caregiver can monitor how much the child is eating. The major barrier to giving adequate amounts of food to children, however, is that parents think children know when and how much to eat. While most mothers and caregivers give food in response to hunger, expressed by the child crying, they believe that the child should determine how much he/she eats. Mothers/caregivers stop feeding the child as soon as the child refuses food: “*the child sets the tone*”. Another barrier to giving adequate amounts of food is the belief that the “*child eats small amounts*” and “*they eat less than adults*.” Some mothers/caregivers said they do not give large amounts of food because they do not want their child to get a “big stomach” which they believe is caused by intestinal parasites or from eating too much.

A major facilitator to feeding children adequate amounts of food is caregivers’ desires, as expressed in the Health Baby exercise, to have children who are “*big, healthy, fat, good-looking, strong and intelligent*”. This is at times combined with an understanding that such a child must be fed “enough food and breastmilk.”

⁸ Two problems with this exercise were that the amounts were difficult to accurately estimate using common measures. Also, because the sample sizes were larger for children 12-24 months compared to children 6-11 months, it is difficult to determine if there was an actual increase in the amount of food being fed the older children.

Table 5: Size of Child's Main Meal

Houaphanh				
Ethno-Linguistic group	Number of children age 6-11 mo	Amount of food in main meal	Number of children 12-24 mo	Amount of food in main meal
Tai-Kadai (n=19)	7	2 received 1 egg size 4 received 1 handful 1 received 1/2 glass	12	5 received 1 egg size 2 received 1/2 handful 3 received 1 handful 1 received 2 handfuls 1 received 3 handfuls
Austro-Asiatic (n=12)	4	3 received an egg size	8	4 received 1 egg size 1 received 1-2 egg size 1 received 1/2 handful 2 received 1 handful
Hmong-Yao (n=4)	---	---	4	2 received 1 egg size 1 received a handful 1 received a small bowl
Savannakhet				
Ethno-Linguistic group	Number of children age 6-11 mo	Amount of food in main meal	Number of children age 12-24 mo	Amount of food in main meal
Tai-Kadai (n=22)	4	1 received 1 egg size 1 received 1 duck egg size 1 received 2 duck egg size 1 received a small bowl	18	4 received an egg size 9 received 1 duck egg size 5 received 2 duck egg size
Austro-Asiatic (n=20)	2	1 received 1 egg size 1 received 1 duck egg size	18	3 received 1 egg size 4 received 1 duck egg size 11 received 2 duck egg size
Champassak				
Ethno-Linguistic group	Number of children age 6-11 mo	Amount of food in main meal	Number of children age 12-24 mo	Amount of food in main meal
Tai-Kadai (n=20)	7	1 received 1 big fist size 1 received a fist size 2 received 2 duck egg size 3 received 1 duck egg size	13	1 received 3 big fist size 1 received 2 fist size 1 received 1½ fist size 5 received 1 big fist size 1 received ½ fist size 1 received ½ small container 1 received 1 duck egg size 2 received 2 duck egg size
Austro-Asiatic (n=20)	2	received 1/2 small egg size 1 received “a little”	18	1 received 3 fist size 1 received 2 big fist size 2 received 1 big fist size 6 received 1 fist size 1 received 1/2 bowl 1 received 2 egg size 1 received duck egg size 2 received 1 egg size 1 received 1/2 egg size (2 no portion information)

Frequency of Feeding

Table 6 reviews the frequency of feeding children 6-24 months.

Table 6: Number of Breastfeeds and Meals Given to Children 6-24 Months in the Previous 24 Hour Period

Houaphanh (n=35)						
Ethno-linguistic group	Children 6-11 mo	Number of breastfeed per 24 hrs	Number of meals per 24 hours	Children 12-24 mo	Number of breastfeeds per 24 hrs	Number of meals per 24 hours
Tai-Kadai (n=19)	7	2 received 7 4 received 4 1 received 2	6 received 3 1 received 2	12	1 received 7 2 received 4 4 received 3 1 received 2 4 received none*	12 received 3
Austro-Asiatic (n=12)	4	1 received 9 2 received 8 1 received 7	4 received 3	8	4 received 3 5 received none*	7 received 3 1 received 2
Hmong-Yao (n=4)	---	---	---	4	1 received 8 2 received 2 1 received none*	4 received 3
Savannakhet (n=42)						
Ethno-linguistic group	Children 6-11 mo	Number of breastfeeds per 24 hrs	Number of meals per 24 hours	Children 12-24 mo	Number of breastfeeds per 24 hrs	Number of meals per 24 hours
Tai-Kadai (n=22)	4	2 received 8 2 received 5	2 received 3 2 received 2	18	1 received 19 1 received 18 5 received 10 2 received 7 1 received 6 2 received 5 1 received 4 1 received 3 4 received none*	3 received 4 13 received 3 2 received 2
Austro-Asiatic (n=20)	2	1 received 20 1 received 4	2 received 3	18	1 received 18 1 received 13 1 received 12 1 received 10 1 received 8 2 received 7 2 received 6 1 received 5 1 received 4 2 received 3 2 unknown	2 received 4 15 received 3 1 received 2
Champassak (n=40)						

Ethno-linguistic group	Children 6-11 mo	Number of breastfeeds per 24 hrs	Number of meals per 24 hours	Children 12-24 mo	Number of breastfeeds per 24 hrs	Number of meals per 24 hours
Tai-Kadai (n=20)	7	2 received 9 ea 1 received 5 1 received 4 1 received 3 1 received 2 1 received none*	3 received 6 ea 1 received 5 3 received 4 ea	13	1 received 13 1 received 12 1 received 7 1 received 6 1 received 4 1 received 2 7 received none*	2 received 6 7 received 5 1 received 4 3 received 3
Austro-Asiatic (n=20)	2	1 received 10 1 received 7	2 received 5	18	1 received 11 1 received 9 1 received 7 3 received 4 5 received 3 1 received 2 2 received none* 1 unknown	4 received 6 6 received 5 6 received 4 2 received 3

*Children receiving no breastmilk had been completely weaned.

The 24-Hour Recall interviews found that 23 of 26 children aged 6-11 months receive the recommended 3 servings of food a day and all but 1 receive breastmilk. While children 12-24 months are still breastfed in this period, the number of meals per day is often inadequate. Only one-fifth of children 12-24 months in Champassak are receiving the recommended five meals a day and a similar pattern occurs in the other two provinces.

The main barrier to feeding young children the correct number of times per day is that mothers want to train their children to “*eat on time*” –that is, when adults eat which is usually 3 times per day. In the KAP Survey 14.7 percent of mothers mention that their own mothers advise them to feed their child this way.

A facilitator to feeding children more often is that some parents seem aware that “*children need to eat more times than adults.*” And “*if parents love their child too much they always feed their child whenever their child needs (him/her).*”

Interactive Feeding

When asked in interviews if they encourage their child to eat more, half of mothers said they do. In observations in homes, however, researchers observed 57 children at mealtimes and, of these 57, only 20 children receive any help or encouragement when eating and the rest were largely ignored: “*They do not talk to the child (while he/she is eating) at all.*” “*The adults only talk among themselves.*” “*There is no conversation except to tell children to behave;*” and “*adults do not talk (while eating), only when the children talk to argue over food.*”

A barrier to mothers actively feeding the child is that mothers feel they have limited time. Data from the KAP survey shows that 70 percent of households have from 2 to 5 children under the age of 5 years of age, making it difficult for mothers to attend to the individual needs of each child. A facilitator to interactive feeding is that in some families, grandparents, brothers and sisters help the mother feed the child by sitting with the child and in some cases encouraging the child to eat additional food.

Caring for the Sick Child

Of 67 mothers/caregivers interviewed, 16 reported that their young child had not yet been ill. Of those children who had been ill according to the KAP survey, 30 percent had been taken either to a traditional healer, village health volunteer, health center, hospital or pharmacy. Of those children who were taken somewhere, 38 percent received some feeding advice as part of the child's treatment. When mothers were interviewed about how to feed a sick child, the majority stated they give the same amount of breastmilk as usual or more and less or no food at all. During the KAP Survey 66 percent of mothers said they give sick children the same or more breastmilk but 62 percent feed their ill child less food and 29 percent stop feeding an ill child altogether.

Barriers to continued feeding or feeding more during illness are that the *“child who is ill has little appetite, and mothers do not press (the) child to eat.”* Again, mothers/caregivers feel that the child decides when to stop eating. A facilitator to feeding the child during illness is that some mothers say they are willing to prepare special foods for the child and coax him/her to eat when ill. In the KAP Survey about 10 percent of the mothers stated that they are prepared to feed their child special foods and to coax him/her to eat when ill.

Sanitary Feeding Practices

Sixty-seven percent of children eat food from either their own hand or their mother's/caregiver's hand while another 21 percent are fed with a spoon. One reason for hand feeding is that glutinous (sticky) rice is not easily picked up with a utensil. In the KAP Survey, 15 percent of mothers report using a baby bottle to give infants liquids. Seventy-six percent of all liquid given in this way is water. Casual observations suggest that little attention is paid to cleaning either the nipple or bottle. Sanitary practices in homes are also found to need improving. Researchers observed unsanitary cooking areas, animals roaming and defecating in and around the house, uncovered water jars, flies in leftover food, unclean utensils used to feed children and other unsanitary practices. In addition, they observed that 45 out of 79 mothers do not wash their hands before preparing food.

PHASE 2

The results of the Trials of Improved Practices (TIPs) are shown in Table 7. During TIPs, most mothers/caregivers tried more recommendations than the one they were asked to try.

Table 7: Trials of Improved Practices (TIPs) Results

Recommendation	Number of mothers or caregivers asked to try recommendation	Number of mothers or caregivers who tried recommendation	Number of mothers or caregivers who can/will continue recommendation on a regular basis	Number of mothers or caregivers who spontaneously tried this recommendation	Total Number of mothers or caregivers who tried the recommendations
Add or give more animal foods	19	19	16	30	49
Increase amount of food	17	17	13	34	51
Increase the number of feedings	15	15	13	34	49
Increase vegetables and fruits	13	12	11	40	52
Total	64	63	53	138	201

Increase animal food

When mothers or caregivers were asked to give their child animal food daily or increase the amount given if these foods are already routinely given, 11 mothers were able to increase the amount of animal food in their child's diet from none to some and 8 were able to increase the amount of animal food they were already giving to the child. Seventeen of these mothers also inadvertently increased the child's total amount of food and 14 increased the number of child's meals. In addition, 13 mothers or caregivers also introduced or increased the amount of vegetables and/or fruits they gave their child.

All but one of the children were enthusiastic about eating more animal food. The mother of the one child, who was 7 months old, said her child preferred breastmilk to animal food—or at least was too full of breastmilk to eat much animal food. Mothers and caregivers reported that their child “*ate a lot, enjoyed eating, played happily, seemed more energetic, did not disturb mother, didn't cry much, slept well*”. Mothers and caregivers mentioned that when children were fed animal foods they didn't disturb the mother as much and she was able to get more work done. Sixteen of the 19 children were still being breastfed. When given more animal food, four of them breastfed less often which was positive from the mother's point of view. Another mother reported that after

eating meat, her child did not want to eat rice anymore, which was not positive from the mother's point of view.

All 19 mothers and caregivers trying this recommendation said they liked the recommendation, which is a facilitator for continuing the practice. Mothers and caregivers mentioned they were constrained by traditional beliefs about giving these foods: *"we were afraid of traditional beliefs."* Some Austro-Asiatic in Champassak believed that animal food could cause worms in young children, and *"Everyone in the family is happy to see that now baby can have (animal) food too."* *"Before father only allowed child to eat fish; now he gives (any kind of animal food) to the child."* Sixteen mothers or caregivers said they could and would continue to give animal foods, while 3 said they would find it difficult to continue to give their child animal food on a daily basis because their sources of animal food were not always reliable which is a barrier for continuing the practice. One mother anticipated that: *"On some days, I will not have animal food, I will only have rice—but (on other days) I will give larger amount."*

Increase amounts of food at each meal and actively feed

All 17 mothers or caregivers were able to increase the amount of food they gave their child. For one 8-month old child the increase in the amount of food was substantial—from 3 small bowls of rice soup per day to 7 handfuls of rice, 1 "finger" of fish, 3 "fingers" of bird, 1 orange and half a banana per day.

In addition to feeding more food per meal, 13 mothers or caregivers also introduced or increased animal food on their own initiative, 16 increased the number of meals given per day and 12 introduced or increased fruits and/or vegetables they served to their child. One mother decided to start cooking (*"change menus such as fry, boil, or make soup"*) instead of always serving her child dried meat.

A major facilitator for continuing this practice is that most children were enthusiastic about receiving more food and parents were surprised that *"child can eat more, enjoys eating more"*, *"child could eat lots, enjoyed eating extra pieces of food"*, and *"child able to eat what the mother gave her, ate much more than before, got full."* Five children did not welcome the increased food at first: *"child spit the food out, so mother left him for a while, then he was able to eat."* When children refused additional food, mothers found other solutions to feeding more such as increasing the number of meals. *"Child refuses to eat big amount of food, so increased the number of meals, and now child eats well."*

In addition, mothers and caregivers reported that with more food, children were *"happier, played more vigorously, cried less, slept better"* and needed less attention, allowing mothers to work more. Of the eight breastfeeding children, three breastfeed less when they were given more food. Other family members were supportive about following the recommendation and one family member in each of the 17 families urged the mother to give the child more food: *"Father liked it, and tried to find food, as much as he could, said if she can eat more, give it to her."* *"Husbands told her to continue giving child more."* *"Other family members say it is a good way to feed child."*

“Grandparents approve.” Because of the positive response to this recommendation, 13 out of 17 mothers and caregivers said they would continue the recommendation.

A barrier for continuing the practice daily for 4 mothers was again the unreliability of their food supply *“Child’s sister, age 13, who is the child’s caregiver and feeder, agrees with the recommendation, will try to do it, but will probably not be able to on a regular basis, as family is quite poor”* and *“I think poor people will find it difficult.”* *“Each family has different conditions. Some can do it, some can’t. It depends on the mother.”* One mother stated that following this recommendation for the baby would be difficult because her time was limited and there were other children to feed.

Increase the number of meals/feedings

For the recommendation on increasing the number of meals from 3 to 6 times a day, all 15 mothers and caregivers were able to increase the meals and/or snacks they fed their child. For example, one child usually receiving one meal was instead fed 3 meals a day and a snack; another usually receiving 2 meals per day was fed 3 meals plus 3 snacks; and yet another older child usually receiving 3 meals a day was fed 6 meals. Most of the mothers/caregivers (13) also increased the amount of animal foods they gave and 1 introduced food into her child’s diet for the first time. Fifteen mothers/caregivers increased fruits and/or vegetables.

A key facilitator to continuing the recommendation was that all the children seemed to appreciate the extra feedings, and only 1 had to be coaxed to eat the extra food: *“Grandmother started feeding, a little bit at a time, now child likes to eat.”* Once again, parents were surprised at how much their child could eat: *“child can eat and eat.”* *“Child could eat what mother gave him, much more than before.”* *“Child ate all he was given.”* The effect of receiving additional meals, again, was reportedly positive: *“played happily by herself, not much crying, not naughty like before, did not bother parents, slept well.”* Of the 9 mothers breastfeeding, two mothers report their infants were breastfeeding less often when they were given more feedings of food.

Thirteen of the 15 mothers and caregivers trying this recommendation said they could and would continue it and felt other caregivers of their child would also follow the recommendation. *“Mother is a housewife, is at home all day. She can do.”* *“Mother likes, able to do, has time to do.”* However, because this recommendation required more time feeding the child during the day, some mothers pointed out that some rural mothers would find them difficult to follow: *“mother is able to do right now, but worries that it will be hard when she has a ‘long work’* and that some mothers might not want to be bothered: *“doesn’t know if others can do—if they would be interested, willing—some are lazy.”*

Increase fruits and vegetables served to children

Of the 13 mothers and caregivers trying this recommendation, 8 gave their child both fruits and vegetables daily, 2 gave just fruits and 2 gave just vegetables. Some families adopted other recommendations as well as the one they were asked to try. Four mothers also introduced or increased animal foods, 16 increased the amount of food, and 4 increased the number of meals per day. However, trying other practices was more common in Houaphanh in the north than in Champassak in the south.

A facilitator to continuing this recommendation was that children accepted and liked the fruits and vegetables given them: *“enjoyed eating, liked the food,”* and *“liked vegetables and fruits, found them easy to digest”*. One child was very enthusiastic: *“child ate much more than usual, grabbed food from mother because mother was feeding too slowly.”* Like the other feeding recommendations, mothers and caregivers said that children receiving these foods *“didn’t disturb mother, played with other children, seemed happy, not much crying, slept well.”*

All the mothers trying the recommendation said they liked it and would continue to feed their child either fruits or vegetables or both, though several mentioned that a barrier to feeding these foods every day or in certain seasons was that these foods were not available every day and some were only available seasonally. *“If we can feed with natural (forest) food, I am very agreeable.”* *“I am interested to know that child can eat a variety of food. Before I did not give, for fear of stomachache.”* *“Good way to give child vitamins.”* One child refused to eat vegetables prepared for him and his father/caregiver did not persist because in the past *“vegetables had caused the child to get boils”*.

DISCUSSION

Reducing child mortality and ensuring food security are important goals in the Lao PDR, as stated in the Interim Poverty Reduction Strategy paper (I-PRSP) (Lao PDR, 2001). To achieve these objectives and others related to child health, as outlined by the Millennium Development Goals (MDGs) (UNDP, 2001), programs need to be designed to reduce neonatal mortality, which makes up a large proportion of child mortality, and child malnutrition, which is an underlying cause in over 50 percent of childhood deaths. The purpose of this study was to examine maternal and newborn care and child feeding practices and make recommendations for improving these practices. The Trials for Improved Practices (TIPs) methodology was used to determine if mothers were able to try and would continue to use 4 key child feeding recommendations.

MATERNAL CARE

This study found that over 80 percent of women give birth at home. While 90 percent of women have someone present during their delivery, only 20 percent are delivered by

doctors and only another 20 percent are delivered by trained or untrained birth attendants. The rest are assisted by a family member—often the husband. These findings are corroborated by national statistics which report that only 7% of women deliver in public health facilities (health centers or hospitals), 14 percent of women are assisted during delivery by trained medical personnel, 15 percent are assisted by trained and untrained birth attendants in the community, and the majority (70 percent) are assisted by family members or friends (Ministry of Health, 1999). In this study, Austro-Asiatic women did not deliver by themselves in the forest as has been reported elsewhere (Ministry of Health, 1999). This difference may be due to changing traditional practices or may simply reflect the fact that the sample did not extend to very remote areas of the country where this practice still may be followed.

During the postpartum period, Tai-Kadai women report that they rest with a fire under their bed for a period of from several days to several weeks. In all three ethnic groups newly delivered or breastfeeding women reported either fasting or eating a limited diet with foods thought to be easy to digest, give them strength and improve the quality and quantity of their breastmilk. While foods eaten by new mothers vary from province to province and among groups, women report that rice with salt and ginger, chicken and boiled root water are commonly consumed in most places. On the other hand, foods that are universally avoided include the meat of white buffalo, white pig, and wild animals, panai fish, rotten, spicy, sour or raw foods and un-boiled water and cold drinks.

The lack of skilled attendants during delivery is a concern for women. In the Lao PDR the estimated maternal mortality ratio is high—650 deaths per 100,000 live births (World Bank, 2002)—and ensuring that women with obstetric complications are referred and transferred to a facility that can manage them needs to be a top priority in the Lao PDR. The tradition of giving special care to postpartum women is positive and may be a way to increase acceptance and use of postpartum care, currently limited, given by the public health system as long as providers are trained to provide it. While information was not collected on the amounts of foods women are eating, this study indicates that many women consume primarily rice and restrict intake of animal foods. To improve maternal nutritional status, women and their families need to receive recommendations that pregnant and postpartum women should not restrict and should even *increase* intake of energy and animal products, which are rich in protein, iron, zinc and other important micronutrients. The practice of Tai-Kadai women resting over a fire may be beneficial in providing the mother rest and keeping the infant warm but the risk of indoor pollution caused by a wood fire should be investigated further as this may have serious health ramifications for both mother and child (WHO, 2002; Bruce, et al., 2000).

NEWBORN CARE

This study found that newborn home care practices need improving. While infants are immediately wiped, they are also washed with warm water, which may increase risk of hypothermia, a major cause of neonatal mortality. To mitigate this risk, it is recommended to maintain a “warm chain” by deferring washing for 24 hours,

immediately wiping and wrapping the newborn, including its head, and giving it to the mother to keep warm and breastfeed (Save the Children, 2001). The few mothers who had given birth in the hospital said this is the procedure used there. Wrapping the newborn is a common practice in Lao PDR, the purpose of which is to keep the newborn warm and, in the south, *“to keep flies off them”*, but educational messages should be disseminated to ensure that washing the newborn is delayed for 24 hours or at least for 6 hours. Hygienic care of the umbilical cord also needs to be improved to include just washing and air drying it. Current practices include applying traditional preparations to the cord *“to protect and help it dry and heal”* which may increase risk of infections.

Internationally, it is recommended to breastfeed newborns within 1 hour after delivery to establish breastfeeding when the suckling response is strongest and ensure infants receive colostrum, produced in the first three days after delivery, which contains essential fats, micronutrients and anti-bodies. Only a third of mothers in the study received advice on breastfeeding when they first started nursing (although three quarters received advice sometime in the first few months after their child was born), making it difficult to follow best practices for initiating breastfeeding.

Both not breastfeeding immediately and giving pre-lacteal feeds appear to be related to the perceived negative attributes of colostrum. All Hmong-Yao in Houaphanh province and about a third of Austro-Asiatic and Tai-Kadai discard colostrum because they believe it is harmful, causing stomach problems in the newborn, or impeding “real” breastmilk from coming in. About half the Hmong-Yao avoid all pre-lacteal foods, but the infant is immediately and exclusively breastfed by a wet nurse in the first few days of life so the infant does not have to consume colostrum. Three-quarters of Austro-Asiatic and Tai-Kadai give pre-lacteal foods, usually rice. There are beliefs that rice is beneficial to young infants and will help the baby grow strong. Some mothers and caregivers believe that the baby cannot be satisfied or a full member of the community until it has had some rice, and that rice is necessary and good for the baby.

Beliefs and customs are major determinants of newborn care and early breastfeeding practices but, according to the findings of this study, beliefs are changing in the Lao PDR through greater contact with health professionals and radio programs, although these messages need to increase in number and coverage if neonatal mortality and malnutrition are to be significantly reduced. Women and their families mention they are willing to change their practices, particularly if they are given a good reason for doing so. Health care providers in facilities delay bathing newborns, which is a best practice that communities, where most infants are still born, need to adopt along with messages about clean cord care. Messages to improve breastfeeding after delivery should focus on increasing the positive attributes of colostrum. A facilitator to improving this practice is that some mothers said they are willing to breastfeed during the first three days, when colostrum is produced, because they believe this would allow or cause “real milk” to come in more quickly and this will benefit the baby. There is evidence that more frequent breastfeeding, in fact, does facilitate the transition from colostrum to breastmilk (Humenick, et al., 1994). Education campaigns in other countries have significantly increased the use of colostrum. In India, 43 percent of mothers gave colostrum after

receiving pamphlets promoting it compared to no mothers giving colostrum in the control group (Tamagond & Saroja, 1992). In Ghana, 96 percent of mothers gave colostrum compared with only 60 percent of mothers before weekly education sessions on health and nutrition topics (including the benefits of giving colostrum) were introduced (MkNelly, 1997).

CHILD FEEDING

Exclusive breastfeeding

The majority of Hmong-Yao newborns are exclusively breastfed for 4-6 months while only about a third of Tai-Kadai mothers and a fifth of Austro-Asiatic mothers exclusively breastfeed their infants for 4-6 months. Mothers report several reasons for not breastfeeding exclusively. One is that they perceive and fear their breastmilk is insufficient in quality and quantity, usually coming to this conclusion when the child cries after being breastfed. Instead of increasing their supply of milk by breastfeeding longer and more frequently, mothers introduce foods and liquids including water to satisfy their baby. There also are beliefs that infants need rice to grow strong and drops of water to learn to suck properly. However, many mothers are confident about the quantity and quality of their breastmilk because their infants are content with only breastfeeding.

Some mothers/caregivers have heard (and accept) from health facility staff that breastfeeding is best for babies. Messages are needed to reinforce good practices of Hmong-Yao women who are already exclusively breastfeeding. For other mothers, awareness needs to be raised that the introduction of other foods or liquids including water are not needed, even in a hot, humid climates (Sachdev, et al., 1991), and that the introduction of anything other than breastmilk to infants under 6 months increases risk of diarrhea and other infections. Since fears of inadequate breastmilk supply are common, mothers need to know that they can increase milk supply by breastfeeding more often and longer. Experience from other countries shows that mothers can understand that adequate milk supply is possible with more frequent and longer breastfeeding. In Honduras, about 25 percent of women understood this concept as a result of increased counseling over a three-year period compared to only about 6 percent of caregivers at baseline (Van Roekel, et al., 2002). For mothers who fear the quality of their milk is inadequate, mothers should receive information about improving the quality of their breastmilk by improving their diet. Women may respond most positively to improving their diet if they think it will benefit their infants, but this needs to be investigated further with women in the Lao PDR.

Because they need to work, mainly as farmers, rural women may leave their infants in the care of other caregivers (usually family members) for up to 12 hours a day. In their absence, infants are given other foods and liquids. It has been shown elsewhere that infants of mothers working outside the home receive less breastmilk than infants of mothers who stay home (Roberts, et al., 1982). To remedy this situation, mothers can be taught to express and leave breastmilk for caregivers to feed to infants, using a clean spoon or cup for older infants. However, several mothers said they take their infants with

them to work and it might be possible to promote this practice. If several mothers work together in the fields, they could take turns in caring for each others' infants, setting up a crèche for babies, as has been suggested elsewhere (Semega-Janneh, et al., 2001).

Rates of exclusive breastfeeding can be increased, even in countries where mothers have to work. In a recent report of a national community-based health and nutrition program, exclusive breastfeeding in children under 6 months of age was significantly higher in the program areas (46 percent) compared to the control areas (19 percent) (Van Roekel, et al., 2002) due to education about the importance of exclusive breastfeeding, how to do it (frequency, during the day and night, etc.), how to express milk, and how the caregiver should feed expressed breastmilk to the baby when the mother is not there.

Continued Breastfeeding Until Two Years of Age

It is recommended that children continue to be breastfed until two years of age. In Lao PDR it is custom to breastfeed for at least 2 year and only about a quarter of women in this study stopped breastfeeding before their child was 2. Some of the barriers mentioned for mothers not breastfeeding until two years of age include the mother becoming pregnant again, the mother wanting to return to her normal diet, the mother becoming tired of breastfeeding, mothers' beliefs that breastmilk has lost its nutritional value after one year, and the child not wanting or needing to breastfeed any longer. Clearly, the traditional practice of the majority to breastfeed the child until 2 years needs to be reinforced as one to be practiced by all mothers. Many of the barriers to women breastfeeding for two years are not insurmountable problems and can be overcome with messages addressing these barriers.

Complementary Feeding

Among the Austro-Asiatic and Tai-Kadai, small amounts of food are often introduced before the child is 5 months of age. Only about a quarter of these mothers and caregivers introduced complementary foods at the appropriate age of between 5-6 months⁹. On the other hand, 63 percent of the Hmong-Yao introduced food at about 5 months of age. The number of available foods in any village was not large. While interviews with headmen and mothers produced long lists of foods eaten throughout the year, seasonality shortens the list of foods actually available at any point in time. Customs and traditions regarding the feeding of infants and young children shorten the list further. Thus when mothers were asked what they fed their child the day before, the list of foods was not long. An example is that only 7 of 117 children received eggs in the previous 24 hours. Thus while a variety of foods are available throughout the year, most foods are only seasonal or occasionally available, or they are not always given to small children even though they may be eaten by other family members. For example, a few believe that children will get sick if food or certain types of food are introduced before 1 year of age and most parents think children can eat only a small amount of food or they are afraid that giving too much

⁹ At the time of the study, the recommendation in Lao PDR was to introduce complementary foods from 4-6 months.

food may cause a “big stomach”. Some parents believe that children should not be given animal foods before the age of 1 year while others said that young children should not be given eggs.

While not given frequently, fruits and vegetables were part of the diet of some children 6-12 months of age in all the villages and provinces surveyed. Some caregivers thought that certain fruits and vegetables should be withheld from children of this age, but this belief was not consistently held.

Rice is by far the most common food given to young children and almost all children over six months of age have rice at least once a day and from two-thirds to more than three-quarters of children consume rice at least three times a day. Half of children receive meat or fish 1-3 times a day. Soup containing fish and meat is given 1-3 times a day to about a third of children in Houaphanh and Champassak provinces but not in Savannakhet. Unfortunately, children often receive only the broth, which has less energy and micronutrients. There was no specific question on the amount or frequency of fat given to infants and young children but some groups (Hmong-Yao in Houaphanh) are known to cook with and consume pork and some reported giving fried vegetables to children so it may be possible to encourage the addition of fat or oil to the foods given to infants and young children.

While portion sizes were estimated using mother’s description of the amounts by household measures such as “a handful” or “an egg size” which are difficult to gauge, it appears the amounts of foods given to children are small and inadequate. Most children 6-11 months received the recommended 3 meals a day with breastmilk, but the children in the older age group, even though they appear to be receiving more food than their younger counterparts, were still eating only 3 meals a day instead of the recommended 5 meals a day (WHO, 1998). This may be related to the increased work required to prepare two extra meals for the older children above and beyond the 3 meals per day the family is normally eating.

Mothers and caregivers decided how many meals the child would receive and often “trained” their child to eat with the adults, which means they received only three meals per day. Encouraging children to eat (inter-active feeding) only occurred in about one-third of feeding situations. For the most part caregivers let the child “*set the tone*” at meals and let them decide what and how much to eat. Only one-third of mothers gave their child a separate dish, making it more difficult for mothers to keep track of the amount of food the child was consuming.

A facilitator to giving the child more food is that many children show interest in food and this encourages parents to start feeding them semi-solid or solid foods. When children cry, parents are motivated to feed them. Mothers and caregivers also are interested in nutrition and in particular want to feed foods that will provide vitamins and nutrients to make the child “*healthy, fat, strong and grow quickly*”. Some are even aware that children need to eat more frequently than adults. Many mothers and caregivers said they do not really know what or how to feed their child and welcome advice from others.

Information on the number of meals, amounts and quality of complementary foods should be advertised widely through the media and by health workers or community volunteers in counseling sessions with mothers and caregivers. Mothers/caregivers need to be encouraged to give children animal foods and green, yellow and orange fruits and vegetables, which supply essential micronutrients such as iron, zinc and β -carotene, a precursor of vitamin A. That mothers are willing to learn and expressed a need to learn are important factors facilitating the uptake of this information.

Feeding the Sick Child

The KAP survey found that 66 percent of mothers continue breastfeeding and may even breastfeed more during an episode of illness. Unfortunately, about the same percentage stop giving food to their ill child. More information would be useful on caregivers' willingness and ability to try feeding more food during and particularly after illness. Since many children become anorexic during periods of illness, feeding the child more food after illness is an important strategy the mother or caregiver should use to ensure the child recovers any weight lost during illness.

Trials of Improved Practices

From the results on complementary feeding, it is clear the timing, amounts, frequency, and quality of foods given to children can be improved. How feasible it is to follow an ideal practice is an important issue, which the Trials of Improved Practices (TIPs) sought to explore. These ideal feeding practices included increasing intake of animal foods, the amount of food, the number of meals and fruits and vegetables. The majority of mothers or caregivers (63 out of 64) were able to try the recommendation they had been asked to try and many of those (53 out of 63) said they would continue the recommendation on a regular basis. In addition, many of the mothers or caregivers simultaneously tried one or more of the other recommendations without being asked to do so resulting in a total of 201 recommendations being tried by the 64 women participating in TIPs.

Mothers and caregivers were enthusiastic about the results after they tried these recommendations. They liked receiving new information and frequently commented that they do not really know what they are doing when it comes to feeding children: *"I was glad that you gave me some new knowledge about nutrition and way of feeding". "Before, I didn't know anything about the nutrition."* *"You came to give advice, it is good and I must try."*

They also were pleased because their children liked eating additional food and different foods, including vegetables and fruits. Although fruits were not fed frequently, this study did not find them to be withheld from children and when using the TIPs methodology, it was found that caregivers were willing to give and continue giving their children fruits. In another similar study conducted in Phongsali and Houaphanh Provinces, researchers found that parents were reluctant to give children fruits until they were 2-3 years of age (AusAID/Lao PDR, 2003). These researchers had not yet conducted TIPs, although this was planned. After trying their recommendation, mothers and caregivers reported that

children were happier and less trouble, which allowed mothers/caregivers to get more work done. Most mothers and caregivers were surprised at how much food their child would eat if they continued to offer food or coax the child to eat. A few mothers said that their child did not want more food initially, but one mother reported she was able to feed additional smaller meals to her child until he was able to tolerate larger meals. Mothers and caregivers also were pleased that they did not have to follow old traditions of withholding certain foods from children. They were interested to hear that that animal foods, fruits and vegetables have important nutrients that children need. A number of the mothers were enthusiastic about becoming experts and teachers in this new way of feeding, and using their own children as models - as the example of what improved feeding can produce. As one woman reported, *"They [the research team] advised me to give the child [vegetables] and it's good [advice] and can make your child strong and healthy."*

There were two major barriers for continuing any recommendation. First there was the constraint of mothers' limited time to prepare extra food or collect it from the forest. Second was that certain foods were available only seasonally or at least not daily. A solution to this latter problem may be, as one mother suggested, encouraging mothers and caregivers to feed extra servings of animal foods, fruits and vegetables when they are available. The constraint of mother's time was a recurring barrier throughout this study. To solve this problem, other family members need to be encouraged to actively participate and assist and support mothers, particularly by participating in the feeding of young children.

CONCLUSIONS AND RECOMMENDATIONS

This study investigated newborn and maternal care practices and infant feeding practices in three areas and among various ethnic groups in the Lao PDR. If rates of infant and child mortality and prevalence of malnutrition are to be reduced in the country, many of these practices will need improving. Recommendations for ideal maternal and newborn care and child feeding practices and results from this research, are shown in Annex B. These are based on international recommendations but include messages that might facilitate the uptake of these messages in the Lao PDR, based on this research. Counseling messages can be developed and tested using these recommendations and health facility and community workers can be trained to use the messages when counseling caregivers and mothers. Using the media to disseminate these messages also will be important in the Lao PDR where many families have little contact with a health facility and community health workers do not yet exist.

Trials of Improved Practices (TIPs) methodology was used to explore if mothers and caregivers could/would try new child feeding practices and continue using them. This methodology has been used extensively worldwide in USAID-funded nutrition programs, national nutrition programs, and when adapting child feeding recommendations for the

Integrated Management of Childhood Illness (IMCI)¹⁰. Mothers and caregivers were willing to try new feeding practices, were enthusiastic about the results from these new practices and reported they would continue following them, as long as the recommended foods and amounts of foods were available. These results show it is possible to improve infant and young child feeding in the Lao PDR and that mothers and caregivers are willing and can increase the amount of energy and essential micronutrients, such as vitamin A, iron and zinc in animal products and β -carotene (pro-vitamin A) in fruits and vegetables given to their children. Animal food were limited in many developing countries by either beliefs or cost but they were the only dietary source of some essential nutrients such as vitamin A (as retinol) and zinc, both which have been found to reduce the severity of a number of infectious diseases and reduce risk of mortality. While iron is found in a number of foods, meat is the only bioavailable source of iron that can improve iron status. Iron is needed to generate energy, for proper brain development and to maintain immune function. Giving animal products in the Lao PDR, most commonly fish, chicken, buffalo and cow, frog or pork is important to ensure children receive important micronutrients. In many families soup with meat is made but only the broth is given to young children. This could have a negative effect on nutrition and messages need to stress that the meat in soup should be fed to children. Fruits and vegetables, more readily available in developing countries but often not fed to young children, contain a number of important plant chemicals needed for good health. Yellow, orange and green fruits and vegetables contain β -carotene which is a precursor to vitamin A and an important source of vitamin A in developing countries.

“Negotiating with the mother” suggested by the TIPs methodology involves asking the mother or caregiver to try a new recommendation to see if she is able to follow it and to then discuss her experience with trying the new practice. Consulting with mothers about their perceptions of new practices and any barriers or facilitators to continuing the practice is an important counseling tool that can help improve use and continued application of ideal practices to improve the health and nutritional status of infants and young children. For newborn care, counseling needs to be given to the caregiver immediately before delivery. This caregiver may vary depending on the setting. For example, in parts of the Lao PDR the father is the primary caregiver during and after delivery so messages to ensure that the mother receives an adequate diet and the newborn is kept warm and immediately breastfed should be directed to both the father and mother. Using TIPs to investigate if caregivers are willing to change newborn care practices should be planned in future studies.

¹⁰ IMCI was developed by the World Health Organization and other partners to introduce the integrated management of the major illnesses and nutritional deficiencies leading to death in children under five years of age.

APPENDICES

A: DESCRIPTION OF RESEARCH METHODS

Major research instruments

KAP (Knowledge, attitudes and practices) Survey

This instrument, consisting of 76 questions, some yes/no some multiple choice and some short answer, was designed to produce quantitative data on newborn care and feeding, and the feeding of young children, as well as on context. In every village the KAP was to be administered to 25-30 mothers or caregivers of children between the ages of birth to two years.¹¹

Interviews

Separate but very similar interview instruments were drawn up for mothers, fathers and "others." These were designed to produce qualitative information via open-ended questions about practices, but more especially about the reasons for those practices. Mother interviews were to be conducted with 6 mothers per village, two with mothers of children below 6 months, two with mothers of children between 6 months and 1 year, and two with mothers of children between 1 and 2 years. One father was to be interviewed in each village, as well as 2 to 4 "others" knowledgeable about newborn care and child feeding, including trained and untrained birth attendants, grandmothers, Village Health Volunteers, traditional medicine specialists and herbalists.

Complementary research instruments

24-Hour Recall Mothers or caregivers with children between 6 months and 2 years were asked to recall all the food and liquid their child had consumed in the previous 24 hours from the time he/she got up in the morning, through the day and on through the night, to include all snacks and breastfeeds. Answers provided valuable semi-quantitative information on children's diets - kinds of food, approximate amounts, number of feedings per 24 hours, to include breastfeeds, time of feedings and time between feedings. Ten of these recalls were to be conducted in each village.

Food Exploration Nine nutritious foods of wide availability from the north of the country to the south were identified. These included chicken; chicken liver and hearts; eggs; fish; papaya; pumpkin; sweet potatoes; morning glory, and peanuts. Photos were taken of the 9 foods, and these were shown to mothers or caregivers of children between 6 months and 2 years in each village. The mother or caregiver was asked whether she/he

¹¹ When mothers were not at home caregivers were asked to complete KAP surveys, mothers' interviews, 24-Hour Recalls and food explorations. There was also a caregivers' interview instrument especially for them.

had access to each pictured food, whether it was fed to the young child, why or why not, if why then how often and if not, then at what age it would be fed. In ethnic villages the local name of the food was also asked. Answers provided useful information on "what" and "why" as pertains to specific foods of known nutritional value and wide availability.

Healthy Baby Exercise A short instrument called the Healthy Baby Exercise was appended to the mother and father interview instruments, to be administered to mothers and fathers who had the time to participate in this additional piece of research. Photos of four Lao babies under the age of two were shown to the parent, who was then asked to select the healthiest looking baby, tell why she/he thought the baby was healthy, and what that baby was probably fed. This provided interesting information on perceptions of health and feeding.

Observations in the Home Every team member was asked to observe the preparation and eating of food as the opportunity arose, and then upon leaving the home, to complete a short form asking about her observations. The information these provided on the feeding context, while not detailed or systematic, provides some useful insights.

Interviews with Caregivers (other than the mother) As noted above, when the mother has to be away from home and can not take the child with her, that child will be left in the care of someone else, sometimes for the entire day. Thus, for example, 15% of the KAP surveys had to be conducted with a caregiver, as the child's mother was not at home. Half of these alternative caregivers were the child's grandmother. A short questionnaire was drawn up to discover the hours such caregivers work and the range of tasks they perform. (In Champassak, the researcher responsible for this form also added questions asking the caregiver what he/she liked and disliked about the work.) As with the KAP survey caregivers, about half these caretakers interviewed were grandmothers, 1 as old as 80. Nine were older brothers and sisters - one just 7 years old. Seven were fathers, and seven were other relatives such as aunts. One aunt had begun caring for the child from its birth, another from 7 days, another from 2 weeks. These interviews provide interesting insights into the care and feeding of a particular segment of newborns and young children.

Village Overview A form was drawn up for interviewing the Headman and elders of each village. Questions included the village's history, villagers' main sources of income, use of birth spacing in the village, nearest healthcare facility, nearest school and market and so forth. Information obtained in these overviews provided a broad context in which information obtained in that village by other instruments could be better understood.

Free Listing of Food As part of the Village Overview the Headman and elders were asked to enumerate all foods available to people in their village from rice fields and gardens, rivers and streams, forest, mobile sellers, markets and other sources. They were asked how seasonal these are, which are given to young children, and why they are or are not given. As with the food exploration, this information provided context by setting out the array of possibilities available to parents to feed their young children.

B. RECOMMENDED MATERNAL AND NEWBORN CARE AND INFANT AND YOUNG CHILD FEEDING PRACTICES

Maternal Care <ul style="list-style-type: none"> • Antenatal • Delivery • Postpartum 	<ul style="list-style-type: none"> • Messages and services to ensure the proper care during these visits. Counseling on exclusive breastfeeding for 6 months, adequate maternal diet and liquid intake and taking iron-folate tablets. • Adequate care with a trained attendant. If this is not possible, community and untrained attendants should have information to ensure a clean delivery, identify danger signs and refer women if necessary. • Adequate care with a trained attendant. If this is not possible, community and untrained attendants should have information to ensure proper care, identify danger signs and refer women if necessary. Give a dose of vitamin A up until 60 days after delivery. Encourage women to eat a varied diet (including animal foods, fruits and vegetables), drink liquids, and not to restrict certain foods.
Newborn Care <ul style="list-style-type: none"> • Immediately After Birth • One Week After Birth 	<ul style="list-style-type: none"> • At the time of birth, provide clean hands, clean delivery surface, clean cord cutting, tying and stump care and clean clothes or wrapping for the newborn, good eye care for the newborn (flushing newborn eyes with boiled water that has been cooled). Wipe and wrap the newborn, including the head, and delay washing for 24 hours or at least for 6 hours; give the newborn to the mother and let her hold him/her skin to skin and cover them both (special attention should be given to keeping the low birthweight baby warm); help the mother initiate breastfeeding (within 1 hour); give counseling to mother on clean cord care (washing and left to air dry with no other preparations applied) and on breastfeeding (frequency—<i>at least</i> every 2-3 hours day and night--and exclusivity of breastfeeding, do not withhold colostrum, do not give pre-lacteal feeds, and to breastfeed more frequently if she feels her breastmilk supply is inadequate). Breastfeeding immediately after birth and frequently and often will help milk come in. • Follow up to reinforce breastfeeding messages and manage any newborn care and breastfeeding problems.
Child Feeding Before Six Months	<ul style="list-style-type: none"> • Feed the child only breastmilk (no other foods or liquids including water) from birth to 6 months of age. • Feed on demand when the child is hungry and at least 8 times in 24 hours. • Breastfeed from both breasts for at least 10 minutes for each breast. • If the supply of milk is low, breastfeed more frequently and longer. • If the quality of milk is low, improve the quality of mother's diet (more food, including animal foods, fruits and vegetables)

	Either take the baby to work so breastfeeding can continue or leave expressed breastmilk with the caregiver to give to the baby with a clean spoon.
Child Feeding From 6-24 Months	<ul style="list-style-type: none"> • Continue breastfeeding until two years of age. • Introduce small amounts of complementary foods (mashed or soft foods) at 6 months of age, along with breastmilk, and gradually start increasing the amounts. • By 8 months of age, most children can be given pieces of food to hold in their hands and by 12 months most children can eat foods the rest of the family is eating. • Give foods of thick consistency, not just broth from soups, for example or thin porridge. • Give well-cooked animal foods/nuts/legumes, fruits and vegetables (at least once serving should be orange, yellow or green to supply β-carotene (pro-vitamin A) every day starting at six months. • Add small amounts of oil or fat to the child's food or cook foods in oil. • Encourage the child to eat at meals and snacks, in between meals. Feed favorite foods. • Provide a separate plate for the child so that you know how much he/she is eating. • Feed children 6-12 months 3 times a day plus breastmilk. • Feed children 12-24 months 5 times a day plus breastmilk. • If you do not have enough food on one day, feed the child extra food and animal foods, fruits and vegetables on another day.
Feeding Sick Children <ul style="list-style-type: none"> • During Illness • After Illness 	<ul style="list-style-type: none"> • Give the ill child with little appetite small amounts of food frequently; encourage the ill child to eat; give the ill child food he/she likes. Continue to breastfeed. • Practice "recuperative feeding" by giving the recovered child more food at each meal and more meals. Breastfeed for longer and more often.
Safe Preparation and Storage of Complementary Foods	<ul style="list-style-type: none"> • Wash hands and child's hands before preparing and feeding food. • Serve food immediately after preparing it. • Use clean utensils to prepare and serve food. • Use clean cups and bowls for the child's food. • Do not use baby bottles at all. If the child needs to be fed expressed breastmilk, use a clean spoon to give it to the baby.

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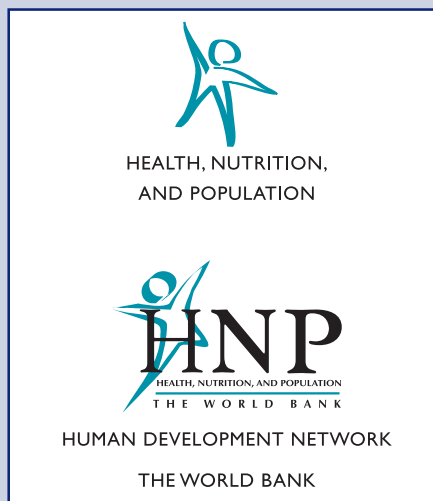
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